

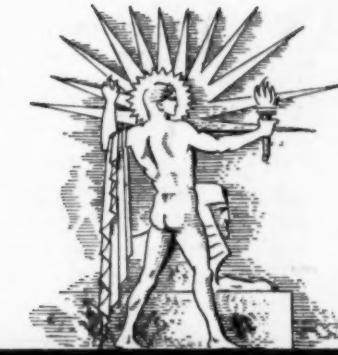
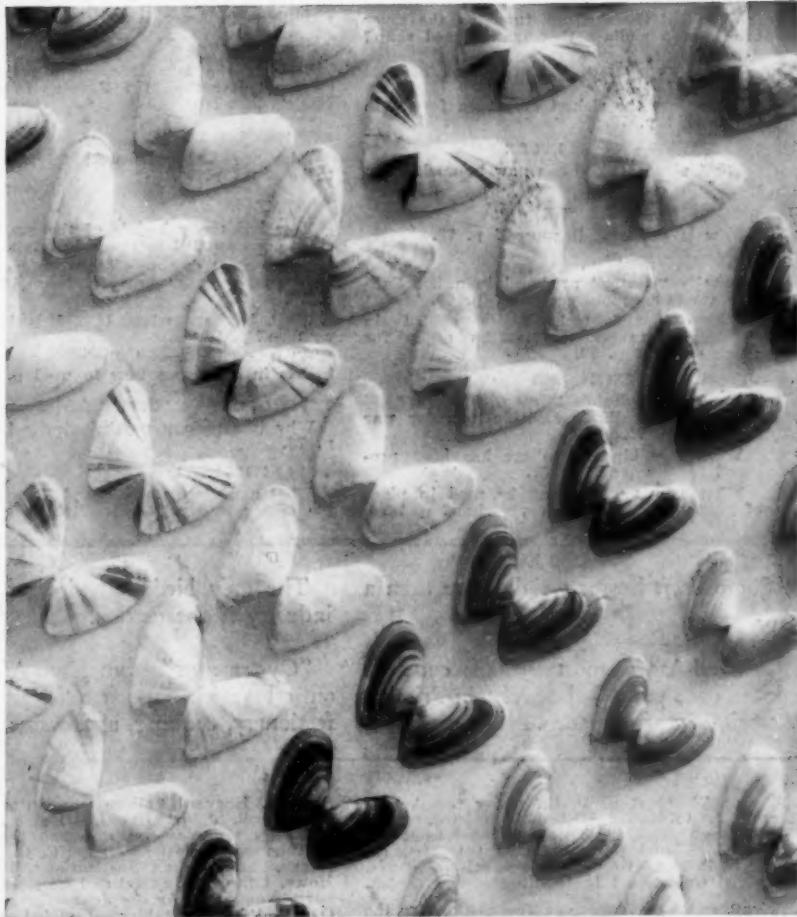
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SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE•



February 1, 1941

Conservative, Variable

See Page 72

A SCIENCE SERVICE PUBLICATION

Do You Know?

Termites do some useful work, destroying fallen trees in the forest.

The United States imports nearly half of the furs sold in markets of this country.

The Pacific Ocean off the California coast is about six inches higher in autumn than in spring.

Earliest ice skaters tied bone runners under their shoes and used iron-tipped poles for propelling themselves along.

Canadian whalers are hunting again off the Queen Charlotte Islands on the British Columbia coast, after a year's layoff.

Directed by Eric Steinlein, authority on early American naval architecture, a WPA project is restoring Perry's flagship *Niagara*.

Alaska's famous Valley of Ten Thousand Smokes has only five steaming fumaroles now, but it is still a spectacular place.

To provide an iron lung quickly for an infantile paralysis case, sheet metal workers designed and built an emergency unit in 28 hours.

What science has learned about soil mixtures and conditioning surface soil can be helpful in improving race tracks, banishing the slow track and the "mudder," says a University of California professor.

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Some draft horses weigh more than a ton.

An all-American team of cows is picked each year by the Holstein-Friesian Association of America.

The only bird that yields leather for industry is the ostrich.

"Oyster nuts" from East Africa yield an oil which is being tested for confectionery, cooking, and cosmetic uses.

SCIENCE NEWS LETTER

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GENERAL SCIENCE

Proposes Special Colleges For Science in England's Service

Sir William Bragg Points Out Peril of Neglecting Science, Leaving Its Use to Others Less Well Disposed

POST-WAR England will have special colleges devoted to training men for a career in applying science in the nation's service, if the proposal of Sir William Bragg, president of Britain's Royal Society, is carried out. (*Nature*, Dec. 7, 1940)

These colleges devoted to applied science would be founded just for this purpose as in the past schools were founded to train men for the ministry or for the State.

The war has brought to England an appreciation of the importance of science in the service of the nation, Sir William points out.

The recently formed Scientific Advisory Committee, British parallel to our own National Defense Research Committee, is in close and direct association with the Cabinet, the nation's governing body. Its functions are broader than merely to give advice in carrying on the war. It is, Sir William explains, "to watch all occasions and opportunities for the employment of science in the service of the nation, and also for the continuous encouragement of that employment."

"Science," Sir William told the Royal Society, "may be rightly or wrongly used. There is a prime danger if those who are in the position to use it rightly shut their eyes to its presence and its power, like an army which relies on bows and arrows when its enemies know how to use machine guns."

"It is not universally or even sufficiently understood how important natural knowledge has become. It is true that in a vague way the nation is brought by the happenings of war to guess at the meaning of scientific research in every kind of enterprise. But still it would be difficult for most people to grasp the significance, much less the meaning, of the description of a fact like this: that the Royal Air Force could not carry out its operations without the knowledge resulting from the studies of cathode rays and electrons made by our physicists, which is equivalent to saying that by this time we might well have lost the War. . . .

"Since experimental science has assumed such a commanding influence on all our affairs, so that we run the risk of great perils if we take no account of it, and leave its uses to others, let us say, less well disposed than ourselves, and, on the other hand, have opportunities of great benefit if we use it rightly, it becomes a first duty to direct our steps accordingly.

"Just as in former times schools and colleges were founded to train men for the service of Church and State, in ways which were appropriate to that high end, so now we have to see to it that the men are produced by our educational systems who can appreciate and act up to a new state of affairs. This can be done without jettisoning any of the fine instruction which has been a proud feature of our older systems."

Science News Letter, February 1, 1941

PHYSICS

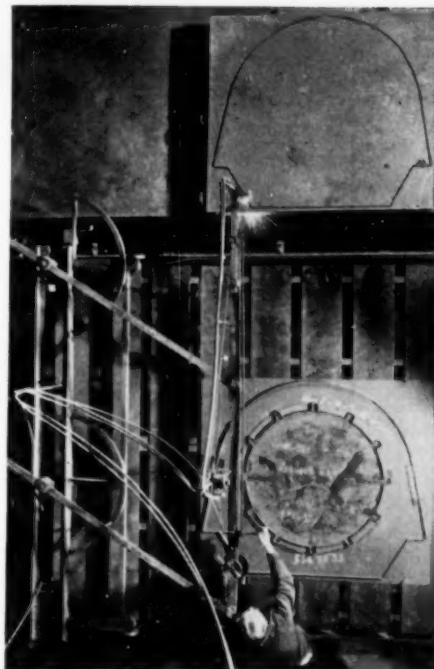
Swiss Scientist Invents Improved Cyclotron

AN IMPROVEMENT on the present form of cyclotron, powerful atom-smasher invented by Dr. E. O. Lawrence of the University of California and now in use in many laboratories, will, it is claimed, give more punch to its atomic bullets.

The new device has just been granted U. S. patent 2,229,572, awarded to Julius Jonas, of Zurich, Switzerland. His rights have been assigned to Aktiengesellschaft Brown, Boverie and Cie, of Baden, Switzerland.

Cyclotrons as now constructed, Mr. Jonas claims, neglect the fact that, as the atomic bullets are speeded by being whirled around and around, their mass increases, in accordance with the relativity theory. This, he states, sets a limit to their speed with current designs.

In the ordinary cyclotron, the electrical field which acts on the accelerating particles is constant. The improvement, quoting from the first claim of the Jonas patent, "comprises progressively increasing the strength of the electric field from



PANTOGRAPH

A familiar drawing instrument for copying a design is less well known in this form which cuts out steel plates for turbine generators in the General Electric plant at Lynn, Mass.

the center to the outer portion thereof by an amount equivalent to the retardation of the charged particles due to the relativistic mass increase of the charged particles at extremely high velocities."

In other words, as the particles move in bigger and bigger circles, and faster and faster, more electricity is put into them to compensate for the increased mass or "weight."

Science News Letter, February 1, 1941

MEDICINE

Diet Important Part of Sulfanilamide Treatment

THE kind of food eaten by patients being treated with sulfanilamide may have an important bearing on the results of the treatment and whether or not the sulfanilamide causes toxic effects, it appears from research by Dr. M. I. Smith, Dr. R. D. Lillie and Dr. E. F. Stohlman, of the U. S. Public Health Service and National Institute of Health.

If the patients get too little protein food, such as meat, eggs and milk, they may be more likely to experience toxic effects from the drug, but the drug may be more effective because of reaching higher concentrations in the blood when the dietary protein is low, it appears.

Rats were the patients in the National Institute of Health studies. A low pro-

tein diet (7% protein) increased their susceptibility to sulfanilamide "by increasing the mortality rate and the incidence of anemia as compared with similarly treated rats on a diet containing 30% protein," Dr. Smith and associates report.

The concentration of the drug in the blood was somewhat higher in the rats on the low protein diet which, the investigators say, "may possibly account for the greater toxicity."

"This also raises the interesting question," they continue, "as to whether this might not be more than offset by the obvious advantages of higher concentrations of blood sulfanilamide in the therapeutic (remedial) application of the drug."

Science News Letter, February 1, 1941

GENERAL SCIENCE

American Campuses Urged For New Sort of Refugee

A NEW sort of intellectual refugee to join the ranks of those driven to our shores by political injustice, is suggested by Dr. Joseph Needham, of the University of Cambridge, after conversations with university professors in the United States.

The peaceful campuses of American universities would be a welcome haven, he believes, to elderly English scholars who have been robbed of their students by war and whose knowledge of antiquities or ancient languages are of little help to the war effort.

As prominent among American professors proposing some such scheme, Dr. Needham mentions Prof. H. S. Taylor and Prof. O. Veblen, of Princeton.

"American sympathy for the British cause is so great," Dr. Needham told his colleagues through the British scientific journal, *Nature* (Dec. 7), "that if at some later date owing to destruction of laboratories by bombing it should be necessary to evacuate a good many British men of science to the New World, nothing could exceed the welcome they would receive from their American colleagues."

Science News Letter, February 1, 1941

Tigers have been known to jump higher than 15 feet.

Normally, 99% of the calcium in the human body is in the bones and teeth.

The American Red Cross is training 300,000 men in the CCC in first aid.

PUBLIC HEALTH

New Air Raid Shelter Danger Worse Than Epidemics

A HITHERTO unmentioned danger of air raid shelters, said to be greater than the danger of epidemics, is reported by Dr. Keith Simpson, of London. (*The Lancet*, Dec. 14, 1940)

The danger is that of death from pulmonary embolism which threatens elderly people forced to spend the night in a sitting or reclining position in air raid shelters.

Pulmonary embolism is a condition in which blood clots plug the arteries of the lungs. Dr. Simpson reports a six-fold increase in deaths from this condition.

The patients died suddenly, usually after leaving the shelters after a night or a succession of nights in them. Most of them were elderly, a little obese, and often had varicose veins in the legs.

"The precipitating condition," Dr. Simpson states, "was without doubt a long period of rest in a deck chair or some similar seat, the front edge of which pressed into the legs as they lay

over it, compressing the veins and causing obstruction, stasis (stagnation of the blood), edema (swelling) and thrombosis (clot formation)—probably in that order.

"The danger to life of pulmonary embolism clearly exceeds the danger (as distinct from inconvenience) of common colds, sore throat, bronchitis, minor epidemic infections and contagious skin diseases to which the Horder Committee have directed their main attentions. There has been no similar rise in the incidence of grave epidemic maladies as far as the death-rate can show.

"The moral is clear: people—especially elderly people—who are forced to spend long periods in air-raid shelters must be given provision for lying down.

"It is noteworthy that cases of fatal pulmonary embolism are already decreasing again, concurrently with the provision of bunks for sleeping."

Science News Letter, February 1, 1941

AERONAUTICS

Russian Passenger Airliner Has Six Engines, 8,000 H. P.

TECHNICAL data concerning the new Soviet passenger airliner, the L-760, accommodating 64 passengers and a crew of ten, are given in the British aviation weekly, *Flight*. (Dec. 12, 1940)

The ship is a monoplane with a wing span of 210 feet, and weighs 46 tons with full load, it is revealed. Six engines, mounted on front of the wings, have a total horsepower of 8,000. There are five cabins in the fuselage and four sleeping compartments in the wings.

"The L-760," says the writer, "was put on to the run from Moscow to the Caucasus last June and covered the 965-mile route at an average speed of 125 m.p.h. This is not fast according to modern ideas, and one does not have to look far for the reasons. The fixed undercarriage is one of them and the large wing (and therefore low wing loading)

is another. In comparing it with the Douglas B-19, it is evident that the wing is about the same size (both have spans of 210 feet), whereas the weight of the Douglas is about 50 per cent greater. The powers of the two craft are about the same.

"Another reason for low speed is the rather ungainly fuselage shape, which is very reminiscent of the huge Maxim Gorky. The engines are liquid-cooled with the air outlet controlled to regulate flow through the radiator."

It is stated that the total air route mileage in the Soviet Union increased during 1939 by 4,350 miles to a total of 88,325 miles. Though present-day figures about air traffic are hard to obtain, it is said, even in 1937 it amounted to 203,000 passengers, 9,000 tons of mail and 36,000 tons of freight.

Science News Letter, February 1, 1941



IN MEXICO
Cycads mingle with oaks on dry hillsides.

PALeOBOTANY

Living Forests Are Clue To Climate in Ancient Times

Horsetails, Tree Ferns and Cycads Similar to Those Growing in America's Past Show What Conditions Were

FOSSIL plants serve as thermometers and rain gauges of the ancient days of the earth.

Their earliest appearances, their migrations, the changes in their stems and leaves, their extinction in different localities, all reflect the responses of organisms sensitive to change in an ever-changing world.

During trends to warmer and wetter climates, leaves increase in thickness and stems attain greater width and girth; while during the slow swings toward frigidity and drought, trunks and foliage are reduced.

Utilizing these principles, Dr. Ralph Chaney of the University of California, research associate of the Carnegie Institution of Washington, has been able to reconstruct the climatic story of parts of the Pacific coast of the United States. In the forests of Guatemala he has found many trees similar to those which grew in Oregon and parts of California 200,000,000, 150,000,000 and 60,000,000

years ago. They show approximately the conditions of temperature and rainfall which must have obtained hundreds of miles to the northward during those periods.

The Guatemalan trees, of course, are not identical with those of ancient North America. They belong to different genera or species. Some of their requirements may have changed. But they provide a basis for a general picture of the great changes which have taken place. Even the fauna of these Central American forests is not vastly different from that of earlier periods in the history of Oregon, all of whose animal life of those days is long since extinct.

It seems, at times, almost like an excursion backwards through time into the age of the dinosaurs when one visits the Guatemalan wildernesses.

Remains of the most ancient forest known to have lived in western North America have recently been found in the Blue Mountains of Oregon.

It covered the shores of an embayment which extended inland for several hundred miles across what is now the Cascade Mountain range. The extent of this seaway is indicated by remains of marine shells representing animals known to have lived widely over the world during the Paleozoic era, when life first became abundant on the planet.

This was the Carboniferous period, more than 200,000,000 years ago. During this time accumulations of stems and leaves in the great swamps of eastern North America were providing carbon for the rich coal deposits. Similarly, leaves and stems of the great Oregon forest were buried in sand and preserved as fossils.

It was a strange forest. Among the most common of the remains which have been preserved are tall rushes with jointed stems related to modern horsetails. They are known as calamites. Fern-like plants unlike any now living were part of this ancient forest.

Horsetails today seldom are more than a few feet high. Their stems are slender. Calamites had trunks up to 75 feet tall and a foot in diameter. Ferns with fronds several feet long are now common in humid forests bordering the Pacific, but their stature is low because their stems are almost entirely underground. The ancient Oregon ferns were fairly large trees. Nowhere in the United States today is there a living woodland even remotely like the Paleozoic forest of the Blue Mountains.

But in Guatemalan valleys which lie in the zone of daily fogs, too high to be considered strictly tropical but never touched by frost or drought are tree ferns in abundance. They mingle on the valley slopes with such relatively modern trees as evergreen oaks, red gums and laurels. They average 15 feet in height and may be twice that tall. Their radiating fronds are evidence of the rich verdure of the ancient Oregon forests, even though the fern fossils are only grey impressions on the sandstone. The ancient fronds differ from those of modern tree ferns in bearing seeds rather than spores. Otherwise they are wholly similar, indicating remarkable conservatism of leaf forms through vast ages.

Bordering the Guatemalan streams grow thickets of horsetails whose stems rise to a height of nearly 15 feet. No longer reinforced by woody tissue as were the great trunks of the calamites, these giant *Equisetums* grow more erect than their smaller relatives of the temperate zone. In places they are so abundant that they seem to cast a shadow of

the past down the ages. Even here, the forest giants of the past are reduced in size and subordinated in numbers by more modern trees.

A third type of plant characteristic of the Carboniferous, the club moss, also is represented in the Guatemalan valleys although less conspicuously, being dwarfed from a giant tree to a creeping vine.

In nearby swamps live distant relatives of the large salamanders which were the most abundant land animals of the Age of Ferns. Small as tree toads, their voices are stentorian. All night long they croak and boom so loudly that a visitor after dark might imagine that giant amphibians still splash among the ferns and horsetails, as did their ancestors in the darkness of 200,000,000 years ago.

Fifty million years later the great horsetails and seed ferns largely had disappeared. They were succeeded by the cycads, a name arising from the position of their leaves in cycles at the end of the stem. These were palm-like in general appearance.

Well preserved leaves of these cycads recently have been discovered at the Petrified National Forest Monument in Arizona. Stems, so completely turned to stone that every detail of woody structure is preserved, have been found in the Black Hills of South Dakota.

They have completely disappeared in these regions, but today whole forests of them cover the slopes of dry valleys in the state of Vera Cruz on the Atlantic slope of Mexico. Their trunks rise to a maximum height of six feet and a diameter of 14 inches. The dark green leaves are nearly three feet in length and the tips are so stiff and sharp that they sometimes cause painful scratches.

Ferns grow near them as they did during Mesozoic time and rivers not far away are the homes of crocodiles, the largest survivors of the age of reptiles. Standing on one of these hillsides we may look out on a landscape whose vegetation and saurian inhabitants are not very different from those of the Mesozoic era.

The last 60,000,000 years of earth history, the Cenozoic era, have been characterized by forests in which flowering plants predominate. The trees which lived in western North America at the start of this era bore large, thick leaves. Many fossils of them have been found in California and Oregon.

There they have completely disappeared. To find living trees with similar

leaves we must go southward to the rain forests of Guatemala and Mexico, and the fog-wrapped slopes above them. Many denizens of the temperate rain forest are quite similar to those of the Cenozoic trees of the West. During that time there must have been abundant rainfall both summer and winter along the Pacific Coast. Today the dry summer makes it difficult or impossible for such trees to live in western North America. The climate must have changed greatly since the days of the ancient forest.

All the animals of these Cenozoic forests have long since become extinct. None are even closely related to living mammals. But the occurrence of primitive primates shows an element corresponding to the monkeys now common in the rain forests of Central America. Animals related to the rhinoceros have a modern equivalent in the tapir of tropical America. Even the large guinea pigs so characteristic of the rain forests of Guatemala have a prototype in a Cenozoic rodent recently discovered by Dr. Chester Stock, Carnegie Institution paleontologist. This is about as close a resemblance as could be expected after so many million years.

The Cenozoic floras of western North America, as revealed by the fossil record, were very similar across regions which now have very different types of forests. The same kinds of fossils are found on both sides of the Cascade mountains. Today most of the rainfall is concentrated on the western slopes of this range, and the area to the east is suited for trees only in the valleys and on higher slopes. Most of the John Day basin is occupied by sage brush and junipers, where once was a rain forest extending eastward from the shores of the Pacific.

We may conclude from this, says Dr. Chaney, that in early Cenozoic time the Cascade range had not yet been raised to form a barrier to rain-bearing winds from the sea. Thus it is possible to date a major episode in mountain building from an analysis of the vegetation of past ages.

Even with these mountains lowered to the level of a coastal plain, the forests of Oregon today would not be like those of Guatemala. The winters are so cold that the more delicate plants cannot live so far north. The summers bring drought which has driven a large number of the trees of the past from this northern outpost of their empire.

The causes of this climatic change are little understood. In part they seem to be

due to altered distribution of sea and land and to the uplift of mountain ranges, resulting in restricted circulation of air and of water. Since winds and ocean currents profoundly affect the climates of today, it is reasonable to assume that changes in their circulation may have affected profoundly the climates of yesterday.

Another cause of climatic change is variation in the amount of energy received from the sun. This has changed slightly during the short time the sun has been under scientific observation. It may well be that it has fluctuated from age to age, with resultant changes in the temperature of the earth and changes in the character of forests, as recorded by the fossils.

One other aspect of modern Guatemala gives us some insight into the environments of the forests of the past in the western United States. In a belt extending across Guatemala, volcanoes rear their cone-shaped peaks high into the clouds. One of them, Volcan Santa Maria, has poured out lava flows in this century and vast quantities of ash have been blown from its crater with explosive violence. After several decades this grey ash still mantles the cornfields.

Similar dramatic events in history may be recognized when we examine Oregon rocks in which the forests of the past have been preserved as fossils. In Guatemala we see scores of feet of volcanic ash and lava accumulated only yesterday. In Oregon similar deposits, with the ash compacted into solid rock, mantle wide areas. They are exposed in the great valley of the Columbia and its tributaries, the John Day and Deschutes rivers.

These beds date from the early Cenozoic. Buried in them are leaves and trunks of trees which give a picture of forests growing on the slopes of ancient volcanoes, even as they do today on the slopes of the volcanoes of Guatemala. Perhaps leaves and branches are being buried there, to tell the story of our present world to paleobotanists of a distant future.

Thus the present runs forward into the future and merges backward into the past. Guatemala of today, its rain forests covering the slopes of active volcanoes, gives us a picture of Oregon's past. The semi-arid plateau of Oregon, reflecting changes in climate and land form down the ages, shows the measure of change which may take place in the Guatemala of some far-off tomorrow.



CLUES TO THE PAST

These giant horsetails, now growing in Guatemalan forests, are similar in appearance to those of the Oregon forests 200,000,000 years ago.

MEDICINE

Neutron Rays Harnessed By Dyes for Cancer Attack

AMORE powerful attack on cancer than is possible with present methods of treatment may come from harnessing fast neutron rays with dyes containing lithium or boron, Dr. Paul A. Zahl, of Memorial Hospital, and Dr. Franklin S. Cooper, of the Haskins Laboratories, found in experiments. (*Science*, Jan. 17)

Mice were the patients in the studies of this method of using neutron rays to treat cancer. The dyes containing lithium or the boron were injected first. The dyes, when injected into the blood, accumulate in cancer tissue in greater concentrations than in normal tissue, and the lithium they contain, like boron, captures the neutron rays and concentrates their cancer-killing action on the tumors. At the same time the normal tissues are spared from the destructive effect of the rays.

A maximum gain of 43% in ray dosage of the tumor over that of other tissues in the same mouse was achieved, the New York scientists report. This could be increased further, it is stated, if lithium or boron isotopes were available in pure form.

Science News Letter, February 1, 1941

ASTRONOMY

Plenty of "Lebensraum" in Other Parts of Universe

In a Galaxy With 150,000,000,000 Stars There Must Be a Large Number of Planetary Systems for Life

PLENTY of living space exists in the universe elsewhere than on earth, and the chances are that life exists there. This is the conclusion of Laurence J. Lafleur, of Brooklyn College, stated in the current leaflet of the Astronomical Society of the Pacific.

Writing on what he calls "astrobiology," Mr. Lafleur states as a possible solution to the problem "the assumption that life comes only from life and never arises either by evolution or emergence from the inanimate, or by special creation. This philosophy avoids the difficulties of origin, and it is possible to assume either that life existed eternally in the past along with an eternal physical universe, or that both had an origin, possibly by divine creation, at some specific era of past time. In any case, the doctrine of Pan-Vitalism implies that life on earth must have arrived here from some other region, possibly on meteorites from another life-bearing planet.

"The whole universe may thus be filled with seeds of life which settle now and then on planetary bodies and grow into life on these planets where conditions are favorable. Conditions in the universe would then be analogous to conditions on earth, where any particular area may for the moment support no vegetation, but where each area is constantly seeded by the wind, and, when conditions become favorable, burgeons with life and becomes in its turn a source of insemination for neighboring land."

Adaptability of life is such that, even under widely different conditions from those which prevail on earth, it might be possible, believes Mr. Lafleur.

"In another world," he says, "a different quantitative distribution of chemicals might leave life possible even to organisms based on the carbon-oxygen-nitrogen-hydrogen compounds with which we are familiar. If nitrogen were rare instead of common and the other elements proportionately commoner, we might very well have organisms that obtain all other elements by a simple process of breathing or absorbing them from the environment, but which are

especially adapted to the pursuit of nitrogen. Or, if oxygen were the rare element we might have organisms that breathe methane and nitrogen, and seek and eat silicates to obtain the oxygen content."

Even if the process of formation of planetary system is very rare, he states, "in a galaxy containing approximately one hundred and fifty thousand million stars, there must be at the lowest estimate a very large number of planetary systems, and in a universe containing many galaxies, a correspondingly greater number."

Philosophical considerations, he suggests, make the possibility of extra-terrestrial life quite likely. With this, in addition to the slight observational evidence, such as the observations which indicate the presence of vegetation on Mars, he writes, "we may conclude, with a fair degree of assurance, that life in the universe is not confined to our planet."

Science News Letter, February 1, 1941



TREE FERNS

These great plants are growing in the rain forest of western Guatemala.

ENGINEERING

Technologists for Defense Sought by Government

TECHNOLOGISTS of all grades, skilled in handling explosives, fuels, plastics, rubber, minerals and textiles, are being urgently sought for defense work, it is announced through the U. S. Civil Service Commission. Salaries range from \$2,000 to \$5,600 a year. Persons with proper education and experience are invited to get in touch with the U. S. Civil Service Commission, in Washington, D. C. or with the board of examiners at any first- or second-class post-office.

Technical editors are also needed by the War Department, the Commission states. Work of such editors will be confined largely to the fields of engineering, chemistry and physics. Applicants will not be given a written test, but will be rated on their education and experience.

Science News Letter, February 1, 1941

CHEMISTRY—MEDICINE

Tests for Diagnosing Pellagra May Result From Discovery

A CHEMICAL test for diagnosing pellagra, more specific than any that doctors have had before, may result from a discovery announced by Dr. Victor A. Najjar and Dr. L. Emmett Holt, Jr., of the department of pediatrics, Johns Hopkins University, (*Science*, Jan. 3).

Diagnosis of pellagra now is made from the skin rash, inflamed tongue and other symptoms. A more exact method of diagnosis, such as a chemical test, would be extremely helpful because the symptoms of pellagra are sometimes confused with similar symptoms brought on by lack of other vitamin chemicals than the pellagra-preventive, nicotinic acid. With the aid of the chemical test, doctors could tell whether or not the patient needed treatment with nicotinic acid.

A chemical, as yet unidentified, appears with a bluish fluorescence in alkali-treated excretions of normal persons who have plenty of pellagra-preventing nicotinic acid in their bodies, the Johns Hopkins doctors discovered.

In pellagra patients, this substance does not appear, but another, also unknown, chemical which gives a whitish-blue fluorescence without alkali treatment appears instead.

Disappearance of the bluish fluorescent substance, called F₁, is apparently the earliest change in the kidney excretions

in pellagra patients. As the disease progresses, the other substance, called F₂, appears. Treatment of the patient with nicotinic acid, which cures the pellagra, banishes F₂ and allows F₁ to appear again. Both of these substances can be measured quantitatively by the fluorophotometer, although the doctors do not yet know what they are.

An enzyme of which nicotinic acid is a component, Drs. Najjar and Holt suggest as explanation of their findings, serves normally to convert the substance F₁ into F₂. In states of nicotinic acid deficiency, this conversion does not take place and as a result F₁ accumulates. The findings also suggest, the doctors point out, that they may be dealing with the material responsible for the sensitiveness to sunlight of pellagra patients.

Science News Letter, February 1, 1941

ARCHAEOLOGY

American Archaeologists Help Greeks Save Relics

TO TOPSY-TURVY developments in world turmoil, add the vote of American archaeologists to send \$2,000 to help the Greeks hide from bombs treasured antiquities, which—before war's outbreak—archaeologists were busily digging up.

The American School of Classical Antiquities, in Athens, donor of the typically war-time gift, has practically abandoned digging. Members of the school still in Athens are delving into comparatively peaceful libraries and making discoveries—such as forgotten letters by the famous Heinrich Schliemann who opened the ruins of Troy.

Greek officials, who have already stored much statuary and other ancient art in caves, vaults and other hideouts, have a trebly hard task. Funds are limited. Greece is so rich in antiquities that only Egypt and Italy could claim to rival it. And the limestone on which Athens and other Greek cities are built does not encourage tunneling of deep subways or other underground shelters. The limestone does provide caves, and they are useful.

Most fear has been felt for museums and ruins in Athens, Delphi, Olympia, and Corinth. The Athenian military air-drome, Tatoi, experienced Italian attack, but fear of retaliation on Italy's cherished archaeological cities has apparently thus far protected Greek shrines from indiscriminate bombing.

Science News Letter, February 1, 1941

BIOLOGY

Related Mollusk Species Show Opposite Tendencies

See Front Cover

DIAMETRICALLY opposite biological behavior is often displayed by closely related species. This is well demonstrated by the shells in one of the new Smithsonian Institution displays, illustrated on the front cover of this issue of THE SCIENCE NEWS LETTER. One species is a fixed conservative, the other constant only in its variability.

The paler shells in the display are those of the mollusk *Donax gouldii* Dall, from the Pacific coast of the United States. They are always alike—amateur collectors soon tire of them. The more vividly marked ones are appropriately known as *D. variabilis* Say; they occur on the Gulf coast of Florida. Despite the wide variation in markings, the specimens shown were all collected in the same locality.

Less learnedly, *Donax* shells are called wedge-shells or coquina shells. The mollusks that form them are edible; Floridians make soup out of their species.

Science News Letter, February 1, 1941

MEDICINE

Cuff Made from Artery Used to Mend Cut Nerve

THE ENDS of small nerves that have been cut can be reunited by holding them tightly together in a cuff made from a fragment of an artery, Dr. Paul Weiss, of the University of Chicago, reports. (*Science*, Jan. 17)

In the case of very tiny nerves, Dr. Weiss states, neat stitching to hold the cut ends together "becomes a mechanical impossibility." Holding these little nerve ends together by ordinary sewing can never be precise enough, he says, to prevent masses of nerve fibers from "escaping into the surroundings and straying off to uncontrollable destinations."

These undesirable results, he says, can be avoided by the use of the artery cuffs.

Science News Letter, February 1, 1941

IN SCIENCE

NE FIELDS

ORNITHOLOGY

Britain's Wild Falcons Are Doomed To Be Shot

WIILD FALCONS that still nest along the coasts of Britain are doomed because they follow their instincts to capture birds as food for their young. They have been making heavy inroads on carrier pigeons used as means of communication from R.A.F. patrol planes out over the sea to bases on land, so official hunters have been instructed to shoot them and destroy their nests.

These birds, the peregrine falcons, furnished the stock for the hunting birds maintained by nobility and royalty during the days of chivalry. Naturalists are lamenting the decree of death passed against them, but the Air Ministry insists that "safety of the Realm must come first."

Science News Letter, February 1, 1941

MEDICINE

Warns of Possibility of Lead Poisoning From Bullets

SURGEONS in civil and military practice should remember the danger of lead poisoning when deciding whether or not to remove a bullet from a wounded person or to leave it in the tissues where it has buried itself. This warning appears with a report by Dr. Willard Machle, of Cincinnati, of cases of lead poisoning by bullets. (*Journal, American Medical Association*, Nov. 2.)

Lead poisoning from bullets left in the body is rare, but lead can be absorbed from the bullets, particularly if they lodge in the bones at the joints, as in the two cases which Dr. Machle saw. Altogether only 40 such cases have been reported since 1867, he says, and in some of these it is doubtful whether the diagnosis of lead poisoning would be made today when doctors have laboratory tests to help interpret the symptoms.

Shrapnel pellets, rifle and pistol bullets, musket balls and bird and buckshot were all included in the 40 cases of lead poisoning from bullets left in the body. Considering the large number of shrapnel and rifle bullet wounds sustained in

the war of 1914-18, Dr. Machle points out that it is particularly noteworthy that bird and buck-shot accounted for a fairly high proportion—about one-fourth—of the 40 cases reported between 1867 and 1940.

Science News Letter, February 1, 1941

PHOTOGRAPHY

New Lens Speed Rating Permits Better Exposure

A NEW system of rating the speed of movie camera lenses, was described by D. B. Clark, executive director of photography in the 20th Century-Fox Studios, speaking before the Society of Motion Picture Engineers. It may prove useful for all amateur and professional photographers.

Usual method of rating the speed of a lens is by its "F. value." This is the ratio of the diameter of the front part of the lens to the distance from its optical center to the film when focussed on a distant object. However, some lenses contain more pieces of glass than others, and more light is lost by absorption and reflections from the various surfaces.

Cameramen noticed, said Mr. Clark, that when they interchanged lenses during a shooting, the picture was far from uniform, even though all lenses were set to the same F. number. Some ratings were as much as 100% in error, when reduced to the actual light that reached the film. With the new method the lenses are tested with an "electric eye," and rated in terms of a standard 35 millimeter lens at F. 3.2 with a light source of fixed intensity.

"The result," he said, "is a lens system wherein a light speed-rating represents the same amount of light, and the different light stops on the different lenses indicate a true proportional value of the basic light."

Science News Letter, February 1, 1941

INVENTION

Motor Driven Eraser Corrects Mistakes Easily

ERASING of mistakes by accountants or draftsmen is made easier with a new motor driven eraser. A rod shaped eraser, seven inches long, runs through the center, and through the armature shaft of the ball-bearing motor unit. It is held at the end by a chuck. The machine is operated by a control button under the index finger. (*Charles Brusing Co., 100 Reade St., New York City.*)

Science News Letter, February 1, 1941

PHYSICS

Six Elements Produced by Transmutation of Uranium

FIRST determinations of the amounts of various elements produced by transmutation of uranium 235 in the breaking-up process by which it is hoped to produce atomic power have been made by Drs. A. V. Grosse, E. Fermi and H. L. Anderson, of the Columbia University Department of Physics. Their results are announced in a report to the *Journal of the American Chemical Society*. (Dec. 26)

When the form, or isotope, of uranium known as U 235 is hit by a neutron, a tiny atom fragment, it breaks up into two pieces, which are different elements. Dr. Grosse and his associates find that the results of this division, or fission, fall into two groups, one of heavy elements, the other lighter ones. In the first is iodine, xenon, caesium, lanthanum and cerium; in the latter molybdenum. They have computed the proportions of each that will result from the fission of 100 U 235 atoms.

On the average, they have determined, the yield would be a little more than 50 of the heavy group elements, and about 6 of the lighter.

However, they point out, the equation they have made to show the results "is as yet incomplete, for the fission of 100 atoms of U 235 will produce 100 atoms of the heavy group and simultaneously 100 atoms of the light element group (in addition to neutrons and energy). It indicates that the discovery of additional fission fragments is to be expected."

Science News Letter, February 1, 1941

NUTRITION

Hungary Invents Ersatz Hamburgers

HUNGARIANS are now eating ersatz meat, concocted cheaply from "twelve garden plants and vegetables", and Germany may borrow the idea for large-scale production, says the U. S. Department of Commerce's Foreign Commerce Weekly.

Put up as a powder, the meat invention is made edible by adding water, salt, and bread, and can be cooked in hamburger or sausage-cake style by adding butter, cream, and spices, according to report. About 2.2 pounds of artificial meat are said to contain 3,727 calories, and to consist of 40% carbohydrate, and 22.3% of white albumen. Cost of four portions is figured at less than 20 cents.

Science News Letter, February 1, 1941

CHEMISTRY—AGRICULTURE

Whey To Make Candy

Dairy By-Product, Now Largely Wasted, Developed Into Tasty Confections By Agriculture Department Scientists

By DR. FRANK THONE

CANDY made from whey, a dairy product hitherto largely wasted, is science's latest offering to America's sweet tooth—and also to the prosperity of American farmers and dairymen. Deliciously tempting, in half-a-dozen forms, it has been made up on a generous experimental scale in the laboratories of the U. S. Department of Agriculture in Washington by workers under the direction of Dr. B. H. Webb of the Bureau of Dairy Industry.

Feminine America will take lively notice when it is learned that this new whey candy is definitely less fattening than kinds now on the market, as indicated by tests made on experimental animals. Whey candy itself is not obtainable commercially at present, although it is hoped that candy manufacturers will soon become sufficiently interested to undertake its large-scale production.

The new candy is made from sweetened condensed whey. Whey is the watery liquid that is left when cream (butterfat) and cheese (casein) are removed from milk. It still contains valuable food materials, notably a certain amount of protein and considerable quantities of lactose or milk sugar. About 7% of whey consists of solids, and three-fourths of the total solids is milk sugar.

Although vast quantities of whey are produced in creameries and cheese factories all over the country, it is either put to such low-grade uses as feeding pigs or even thrown away outright, for lack of suitable ways of getting it into use as human food. Complete drying into powder makes it readily transportable to market. It is used in feeding young children and in other diets where high mineral content and easy digestibility are especially desirable. However, these special uses account for only a small fraction of the total whey output of the country's great dairy industry. New outlets are still being sought.

Fully dried, powdered whey is not necessary for the making of the new candy. The usual procedure is to use sweetened condensed whey, primarily because it costs substantially less than the

dried product, and yields results just as satisfactory.

Sweetened condensed whey is made by adding 7% of ordinary granulated sugar to the whey (after first pasteurizing it) and then boiling off the water in closed vessels under partial vacuum and at moderate temperature, until the originally watery fluid has been reduced to a thickish, cream-colored sirup. This will keep indefinitely in closed containers, without further treatment. It is usually stored in large sirup cans until wanted.

Two of the most successful forms of whey candy thus far worked out are fudge and caramels. In each, the sweetened condensed whey constitutes nearly half the total weight of ingredients. The rest is made up of standard candy-making materials such as corn sirup, invert sirup, sugar, skimmilk solids, coconut fat, butterfat, chocolate and chopped nuts. The materials are cooked in a kettle having a fast double-action stirrer, and finished in the manner usual for handling such candies.

The real innovation, in form as well as substance, is a confection which Dr. Webb has christened "Wheyfers." Coated with chocolate, wheyfers are a crisp and crunchy candy somewhat like molasses chips, but without the hard texture which many persons find disagreeable in that confection. They are also entirely different in flavor; most of those who have tried wheyfers are enthusiastic.

Wheyfers are the easiest to make of all the forms of the new whey candies. Only one ingredient besides the sweetened condensed whey is used. This is a finely ground pre-cooked dry cereal. Chopped nuts can also be added, although they are not essential.

The sweetened condensed whey is first whipped in a motor-driven beater until its volume is at least doubled. Then the cereal is added until the whey has become a somewhat thickish paste. This is put into a machine called an extruder, which squeezes it out in strips about a quarter of an inch thick, very much as toothpaste is squeezed out of its tube.

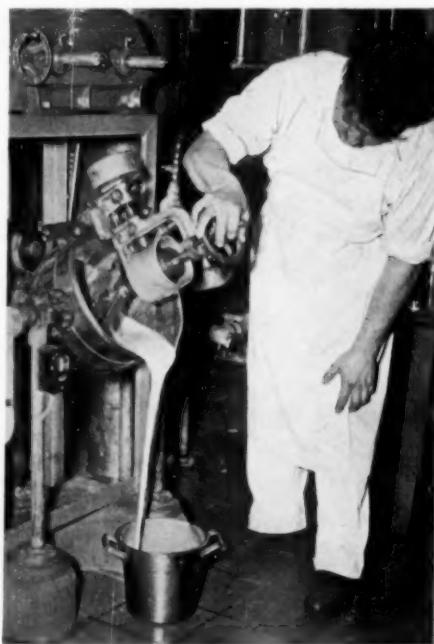
The strips of raw wheyfer material are caught on a screen tray that slowly moves under the extruder. If nuts are

to be added, they are first sprinkled on the screen. After the tray is covered with the damp strips it is placed in a drying oven, with the temperature at just the boiling-point of water, and kept there until the wheyfer material is dry and crisp. Then the strips are taken out and cut into convenient lengths.

They make exceedingly tasty nibbling at this stage. Indeed, when Dr. Webb has been making up a batch of them for experimental purposes, and has a pile of wheyfers on the laboratory table, it is remarkable how the number of persons increases, who have errands that will take them through his laboratory!

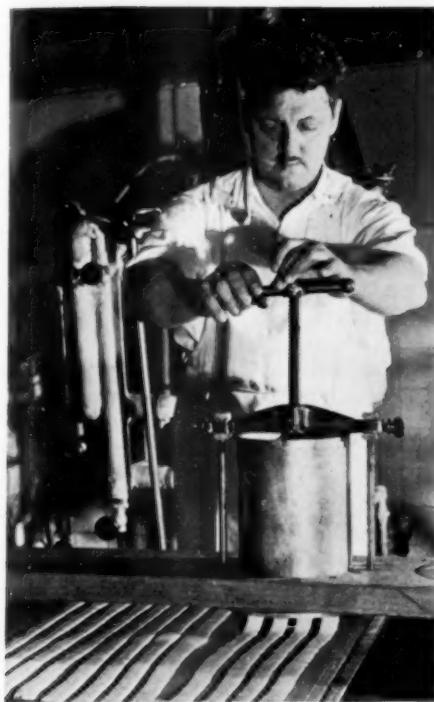
Wheyfers would not need chocolate coating to make them more attractive to most candy fanciers; they are plenty good enough as they are. The trouble is, that in dried form whey possesses a strong attraction for water in the atmosphere, and soon becomes sticky if the humidity becomes at all high. Wheyfers keep all right in winter, in most places, because the humidity is low, but damp weather in the summer would spoil them. Hence the chocolate coating, which serves as a kind of water proofing.

Whey has not always needed these modern improvements to get people to



POURING

This laboratory worker at the U. S. Bureau of Dairy Industry is pouring a batch of whey candy from the mixer.



WHEYFERS

Here is the new sort of candy coming from the machine onto the screen tray ready to slide into the drier. Later the strips will be cut up and coated with chocolate and will taste somewhat like the "chips" you get in mixed chocolates.

consume it. It used to be a rather popular beverage in country districts, in an earlier and simpler age—witness Little Miss Muffet and Old Grimes. Then as now, whey was a by-product of dairy operations, and it wasn't thrifty to waste it. However, when butter and cheese were made in small quantities on individual farms, there wasn't so much whey but that little girls and old grandfathers could drink it up and like it. Now, with cheese being made by the trainload in huge factories, whey flows out in rivers, and larger-scale avenues of consumption must be found for it. Hence the research of the Bureau of Dairy Industry, which promises a time soon to come when you can finish a dinner with cheese and bonbons that both came out of the cow.

Science News Letter, February 1, 1941

ORADIO

Conway P. Coe, U. S. Commissioner of Patents, Lawrence Langner, secretary of the National Inventors Council, and Watson Davis, director of Science Service, will discuss the work of the Council of which all three are members on "Adventures in Science," over the coast to coast network of the Columbia Broadcasting System, Thursday, Feb. 6, 3:45 p.m. EST, 2:45 CST, 1:45 MST, 12:45 PST. Listen in on your local station. Listen in each Thursday.

ASTRONOMY

New Comet Discovery Is Third Made During January

On Same Night That Friend's Comet Was Confirmed, Encke's Return Was Seen; Third Will Be Visible to Eye

WITH three comets discovered during January, one of which will soon be visible to the naked eye in the southwestern sky after sunset, the year 1941 has made a good start, astronomically speaking.

The latest discovery was reported first by Dr. John S. Paraskevopoulos, in charge of Harvard Observatory's Boyden Station, near Bloemfontein, South Africa. He found it on Jan. 23, when it was in the constellation of Ara, the altar, a group not visible from the United States. It was then of magnitude 3.5, bright enough to be seen easily without a telescope, and had a tail about ten times the diameter of the full moon in length. The next night the comet was independently found by three Argentine astronomers, named Dartayet, Bobone and Cecilio.

Within a few days enough observations had been secured to permit Leland E. Cunningham, of Yale University Observatory, to calculate its orbit, and predict its path. His work shows that it was closest the sun on Jan. 27, at a distance of 73,500,000 miles.

The ephemeris, or time table, that he prepared of its motion, indicates that it is moving northeasterly, through the group of Grus, the crane, Sculptor and Cetus, the whale. At the beginning of February, it will reach a position where people in the United States can see it just after sunset. This is shown by the map on this page. The horizon is shown about where it would be at 40° north latitude at 6:00 p.m. The numbers 3, 7 and 11, respectively, show its place on those dates.

By the time the comet appears in these groups, it will already have started to fade so the sooner you look for it the more likely you are to find it. By the eleventh of February, it will be around the fourth magnitude. The moon will then be full, adding further to the difficulty of seeing it.

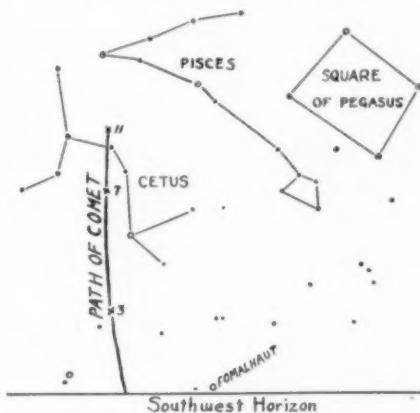
Within an hour after he had verified the year's first discovery of a new comet, made by an amateur astronomer in California, Dr. George Van Biesbroeck, of the Yerkes Observatory, Williams

Bay, Wis., completed the first observation of Encke's periodic comet on its latest visit. This is the most frequent of these regular visitors, coming around every 3.3 years. It was then in the constellation of Pisces, and of the 17th magnitude. It is never visible to the naked eye. Astronomers have watched it on each of its 35 returns since 1819, when its periodicity was first recognized by Johann Franz Encke, German astronomer after whom it is named.

Clarence L. Friend, amateur of Escondido, California, was the discoverer of the new comet, on Jan. 17. It was the third he has made. Independently discovered the next day by E. J. Reese, of Uniontown, Penna., officially it is the Friend-Reese Comet. When Dr. Van Biesbroeck observed it, on Jan. 18, the object was still in the constellation of Lacerta, the lizard, a tiny group seen in the northwestern evening sky. It is above Cygnus, the swan, in which the "northern cross" appears, and below Cassiopeia. It was then of the tenth magnitude, with a definite nucleus and a short tail. It will not reach naked eye visibility.

Friend's comet was found just as Cunningham's comet, which, to the disappointment of astronomers, did not become as spectacular as they had hoped, was disappearing from view. Cunningham's comet did, however, reach an unusual degree of brightness, and was seen with the naked eye by many observers.

Science News Letter, February 1, 1941



PHYSICS

Electricity Could Be Collected From Light Beam

Amount of Current Is So Minute, However, That It Will Not Be Possible to Use It as Useful Source

A POWERFUL beam of light can act as a battery, so that electricity can be collected from it at two different points. This is indicated by the experiments of Dr. Felix Ehrenhaft, Director of Physical Institute of the University of Vienna in the days before Austria ceased to exist. Dr. Ehrenhaft, now in New York, has reported his results in a communication to the English scientific weekly *Nature* (Jan. 4).

The experiments give no hope, however, of the use of search-light beams as a useful source of wireless power. The amounts of electricity involved are so minute that only the most delicate measurements can detect them.

The experiments were made by watching the behavior of minute particles, which floated in the air in the path of the light beam. They were surrounded by an electrical field and sometimes they moved

towards the light, sometimes away from it. This was due, Dr. Ehrenhaft believes, to the interaction between the field of the beam itself and that induced around it. Similar effects were obtained with magnetic fields, showing also that the light beam is magnetized.

From these studies, he concludes that along the beam at different points there must be differences of electrical potential, as there are between the terminals of a dry cell, though far smaller. Thus, theoretically, it would be possible to insert electrodes into the beam at different places, and draw current off, though it is difficult to imagine how such minute currents could be detected.

Such drawing of current from a light beam is different from the conversion of light energy into electrical energy, when it falls on a photoelectric cell, or "electric eye."

Science News Letter, February 1, 1941

this country's great timepiece manufacturers. Those in use at present are spring-driven, like watches. This increases their complexity somewhat; also, if fuses with wound-up springs are kept in storage for several years the metal in the springs may undergo changes that will make their action undependable. A springless fuse is therefore highly desirable.

In Mr. Bold's fuse, small steel balls are fed by an automatic device into deep teeth or pockets around the rim of a wheel mounted a little off-axis in the pointed nose of the shell. The spin imparted to the shell by the rifling of the gun tends to throw the balls away from the center, by centrifugal force. As they push toward the outside, they turn the toothed wheel that holds them. At the outmost point in the rotation, each ball finds a small round hole through which it can escape, while another is fed into an empty pocket, back where it started from.

Thus the wheel is kept rotating, and in turn drives the clockwork train to which it is geared. When this reaches the point for which it was set, a strong coiled spring drives a firing pin into the primer and explodes the shell.

Science News Letter, February 1, 1941

GENERAL SCIENCE—OPTICS

Microscope Cover Slips Now Made From Plastics

COVER slips, used over preparations to be examined in the microscope, are usually made of glass, but now they can be secured of transparent plastic. They are satisfactory for many purposes, though they do not resist strong acids, alcohol, or acetone. (American Medical Specialties Co., 12 East 12 St., N. Y. C.)

Science News Letter, February 1, 1941

PHYSICS

Fuse for Time Shells Uses Weights, Not Springs

NEWEST precision clockwork fuse for time shell works on the old-fashioned principle of a grandfather clock, driven by weights instead of a spring. The only difference is that in-

stead of being pulled upon by the force of gravity, they are subjected to the centrifugal force produced by the spinning of the shell as it flies along its trajectory. But the weights do run a clock in the nose of the shell, and when it is time for the clock to strike it goes "bang" instead of "bong."

The device has just been granted U. S. patent 2,228,905. It is the invention of Frederick W. Bold of Chelsea, Mass., who has assigned his rights to the Waltham Horological Manufacturing Company.

Largely as a result of need for greater precision in timing the burst of anti-aircraft shell, the old-fashioned powder-train fuses in use up to the time of the first World War have been displaced by compact clockwork trains, that can be turned out on mass-production basis by

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GENERAL SCIENCE

Britain's Defense Aided By "Central Register"

Listing of 200,000 Scientists and Technical Men Facilitates War Research; Even Aliens Are Listed

BRITAIN'S all-out defense is being aided by specially developed machinery for immediate placing of technically trained men where their services are of the greatest value to the nation. Details of the plan are made public in *Nature*. (Dec. 14, 1940)

When a Government department or other defense agency needs men, a call goes to the Central Register, which is a listing of scientific men and their talents similar to the National Roster of Scientific and Specialized Personnel in the United States. Within a few hours or at most a few days, men with the required technical training and experience are located. It is discovered whether they are available and willing to undertake the particular job in question. Their present employers are questioned and permitted to offer objection to having the worker taken away. And the list of those available and qualified is furnished to the agency in need of the special services.

In the year in which it has been in operation, the Central Register has placed 9,016 persons in Government and war work, including 1,469 scientists. The Register now contains the names of 200,000 persons—stepped up from 97,000

after the Government required the compulsory registration of all engineers, engineering scientists, chemists and physicists.

The function of the Register, it is pointed out in *Nature*, is not to find jobs for men but to find men for jobs.

In order to make it easier for the Register officials to understand and anticipate the personnel needs of the Government and war industries, the Register was divided into two non-technical and five technical sections. Each of the technical sections was placed under the direction of a qualified scientist or engineer.

The Central Register keeps in close touch with the Scientific Advisory Committee, which is charged with the responsibility of making applications of science to the war effort and planning scientific research which might aid the Government in the emergency.

All but one of the members of this Scientific Advisory Committee, which parallels America's National Defense Research Committee, serve also in an advisory capacity to the Central Register. This makes it possible in planning new scientific research, or new applications of science, to think at the same time in

terms of men qualified to undertake the program.

Even aliens are registered so that their services will be available in the war effort. At present the names of 3,400 qualified professional men are ready as soon as the Government takes steps so that "friendly disposed aliens" can be permitted to help in the war.

Science News Letter, February 1, 1941

ARCHAEOLOGY

Indian Pottery Shows Evolution of Swastika

NEW LIGHT on evolution of the swastika in prehistoric America, centuries before German Nazis adopted the symbol, is revealed on little-known Indian pottery at the Field Museum of Natural History.

That the swastika was popular in the ancient Southwest is plain from its persistent frequency in an array of 900 objects which the museum has selected to picture in an illustrated report on painted pottery of Anasazi Indians. Much of this pottery, unearthed 50 years ago, has never been seen by the public or even by students.

Indians preferred the hooked arms turning left, just the opposite of the Nazi pattern, is the verdict of Dr. Paul S. Martin and Mrs. Elizabeth S. Willis.

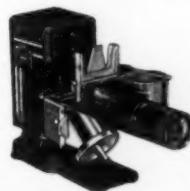
Study of the art shows that in some



INDIAN SWASTIKA DESIGNS

Turning it the wrong way and making it curved were variations of the fundamental swastika design incorporated by Anasazi Indians of America's prehistoric southwest.

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Society for Visual Education, Inc.
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cases, however, the Indians reversed the arms to turn right, and in some cases they used curved rather than straight lines. Also, they drew separate Z-like forms which would form swastikas if moved together to cross. These variations, it is believed, may show how the Indian artists experimentally hit upon

their left-hook swastika form.

The swastika has been called one of man's earliest ideas in design, when he began to draw circles, squares, crosses and other symbols. It is found on pottery in Mesopotamia made before 3000 B.C.

Science News Letter, February 1, 1941

ascribed by the astrologers before preliminary observational tests of the influences could have been made, and even before accurate orbits could be assigned to the planets."

The committee quotes a statement prepared by the Society for the Psychological Study of Social Issues. In this, it is said, "Faith in astrology or in any other

PSYCHOLOGY—PSEUDOSCIENCE

Astrology Lacks Every Scientific Foundation

It Is Also Declared To Be Psychologically Harmful Because It Encourages Flight From Real Life Problems

ASTROLOGY, the tenets of which hold that the stars and planets exert an influence on human events by which predictions may be made in advance, is denounced as lacking every conceivable scientific foundation as well as being psychologically harmful, in a report issued by the Boston and Cambridge Branch of the American Association of Scientific Workers.

It was prepared by a committee of which Dr. Bart J. Bok, associate professor of astronomy, Harvard University, is chairman, and Mrs. Margaret W. Mayall, research associate of the Harvard Observatory, is secretary. Methods and claims of the astrologers are briefly summarized, and reasons given why they are not accepted by scientists. The complete report will be published in the *Scientific Monthly*, organ of the American Association for the Advancement of Science.

"An interpretation of the rules laid down by astrologers demands the existence of an unimaginable mechanism of action," it is stated. "Astrologers have not provided us with as much as a sound

hypothesis that might serve as a basis for their speculations. Astrologers attempt to offset this lack of a sound working hypothesis by the introduction of terms and concepts that are unknown to physicists and astronomers. No one, with a high school training in physics, should be fooled into accepting an explanation of the laws of astrology in which the term 'cosmic vibration' figures prominently.

"Scientists would feel justified in considering astrology as a legitimate field of scientific inquiry if astrologers could claim that its basic rules had been established through a rigorous study of correlations. This is not the case. The rules by which astrologers interpret their horoscopes have not been derived from any known experiments or observations. Astrologers frequently claim the observational basis to be in the experience of forgotten generations far back in antiquity, but pure superstition can claim as sound a basis. In the cases of planets discovered in our times (Uranus, Neptune and Pluto) the evidence is conclusive that their influences on men were

Science on the Radio

SUNDAY

"March of Health," dramatized presentation dealing with public health, MBS, 1:00-1:15 p.m.

WEDNESDAY

"Doctors at Work," dramatic survey of many facets of medical practice, produced in cooperation with the American Medical Association, NBC Blue, 10:30-11 p.m.

THURSDAY

"Adventures in Science," science news of week surveyed by Watson Davis, director of Science Service, and presenting a guest scientist, CBS, 3:45-3:55 p.m.

FRIDAY

"Medical Information Bureau of N. Y. Academy of Medicine," talk by notable figures in medical world, MBS, 10:00-10:15 a.m.

"Radio Magic," dramatization, and commentary on radio phenomena by Dr. O. H. Caldwell, NBC Blue, 7:15-7:30 p.m.

"Unlimited Horizons," dramas and discussions of physical sciences produced in cooperation with the University of California, Stanford University and the California Institute of Technology, NBC Blue, 11:30-12:00 p.m.

SATURDAY

"This Wonderful World," natural history quiz among school children visiting Hayden Planetarium in New York, MBS, 1:00-1:15 p.m.

"Highways to Health," talks arranged by Dr. Iago Goldston, N. Y. Academy of Medicine, CBS, 1:15-1:30 p.m.

"The World is Yours," dramas of world of science, based on Smithsonian Institution exhibits and expeditions; produced in cooperation with U. S. Office of Education, NBC Red, 5:00-5:30 p.m.

"Man and the World," dramatic panorama of scientific exploration, discovery and research; produced in cooperation with the Chicago Museum of Science and Industry and the American Museum of Natural History in New York, NBC Blue, 8:15-8:30 p.m.

Eastern standard time throughout.

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occult practice is harmful in so far as it encourages an unwholesome flight from the persistent problems of real life. . . . It is against public interests for astrologers to spread their counsels of flight from reality."

Though no careful, extended, statistical study of the success or failure of astrological predictions, which might prove a decisive test, is known ever to have been made, statistical tests of the supposed broad influences of the planets and zodiacal signs have failed to verify these claims, the report declares.

"Until such correlations are established," the report concludes, "scientists can do a valuable service to society by pointing out publicly that the predictions lack every conceivable scientific foundation."

Science News Letter, February 1, 1941

ARCHAEOLOGY

Reveal Forgotten Wife Of Totalitarian Pharaoh

TOTALITARIAN Pharaoh Unas, who ruled Egypt in the twenty-ninth century before Christ, had a very completely forgotten wife, it is now revealed by archaeologists who have unearthed and entered the tomb of a Queen Nebet among royal burials in Sakkara.

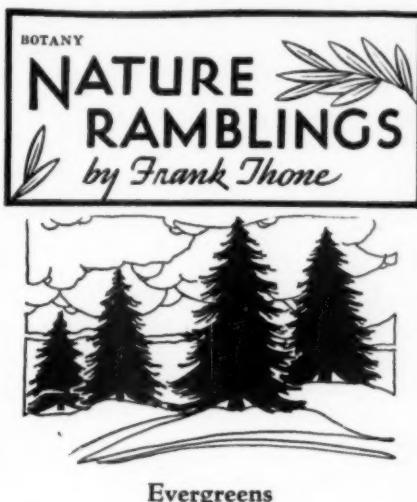
The very name of Queen Nebet is unfamiliar to modern Egyptologists, but Zaki Y. Saad, leader of the explorations, has found convincing evidence in the tombs to conclude that she was undoubtedly the royal wife of Unas.

The empty tomb, pronounced richly sculptured, is adorned with a great array of inscriptions, adding to knowledge of Egypt's fifth dynasty. A portrait of the queen delicately holding a lotus flower is over a doorway.

Pharaohs in the fourth to sixth dynasties are known to have ruled Egypt as absolute monarchs by divine right, and to have held all high offices in the government in dictator fashion, including direction of the armies, legal affairs, and the highly important religious functions of the state. Pharaoh owned all land in Egypt, and was the only earthly inhabitant who looked forward to a heavenly life with the gods.

When the tomb of Pharaoh Unas was first entered in modern times by archaeologists in 1881, the royal burial had been robbed, and a few scattered bones are the only remains of this one-time powerful king.

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Evergreens

FAR NORTHERN lands, we are accustomed to assume without too much thinking, are lands of evergreens. When Kipling speaks of "dominion over palm and pine," it needs no explanation to make it clear he means the wide sweep of the British Empire from the tropics to the arctic seas. Evergreen trees and snow are always thought of together.

Actually, however, a census of evergreen species shows a steady increase in exactly the opposite direction, from north to south rather than from south to north. The greatest and richest evergreen forests in the world are those of the moist equatorial regions, like the valleys of the Amazon and the Congo.

The evergreen forests of the Far North are monotonously composed of only a few species of trees—frequently only one species for many hundreds of miles. The evergreen forests of the tropics comprise thousands of species, with hundreds of the most varied aspect crowded on one small island. Be it not forgotten that the palm, too, has evergreen leaves, and so has the breadfruit tree, and many of the figs, and the mango tree, and many another tree besides, so strange that even their names are unfamiliar to us.

The trouble with us is that we have become used to thinking of evergreens and the needle-leaved conifer trees as synonymous. This is far from being the case. The majority of evergreen leaves are broad leaves; pine and spruce and fir are exceptions rather than the type or the rule.

Even in lands as far from the tropics as our own southern states there are many species of broad-leaved evergreen trees and shrubs; several kinds of magnolias, live-oak, bay trees, holly, mountain laurel, rhododendron, palmetto—any good Southerner could extend the list to your pleasure and conviction.

While of course there is no way of proving it conclusively, it seems likely that broad-leaved evergreens do not invade the North because the weather is too rough. The whooping winds of northern winters would pull at the broad surfaces of their leaves like a gale at the rigging of a ship improvidently caught with all sails set. The heavy loads of ice imposed by glaze storms would be more than any limb, however mighty, could bear. The needle-leaves of the conifers, close-reefed against both wind and ice, are better adapted for survival in extreme winter weather. So the conifers rule the Far North, and the broad-leaved evergreen trees the South.

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ENGINEERING

Winter Scenes in Movies Made in Refrigerated Studio

WHEN you see a movie scene showing actors in the snow, suffering from the cold, their breath showing in clouds, you cannot be sure that it was taken in winter, or even in the mountains. Perhaps it was made in the heat of a southern California summer day, in a special cold studio which was described to the meeting of the Society of Motion Picture Engineers in Hollywood by R. Van Slyker.

Despite the heat from the usual studio lighting system, the studio temperature can be kept at 21 degrees Fahrenheit, with 85 degrees temperature outside. Under these conditions it is not necessary to use untoasted cornflakes for snow, which is the practise in ordinary "winter" scenes. Portable blowers grind 50-pound cakes of ice into powder, and expel it through special nozzles.

Science News Letter, February 1, 1941

INTERESTED? in Science



PURPLE - X Ultra - Violet lamp — a powerful source of U.V. (150 watts, 50 hours, 110 volts, ordinary socket). Minerals, dyes, vaseline, natural teeth shine in its rays. Fun on a party, see who has false teeth or paint skull on face with vaseline. Useful to teachers. \$2.00, express chgs. collect.

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•First Glances at New Books

MEDICINE—BIOGRAPHY

A SURGEON'S LIFE, The Autobiography of J. M. T. Finney—*Putnam*, 395 p., \$3.50. One of America's most eminent and beloved surgeons tells the story of his life with a modesty characteristic of himself but most unusual in an autobiography. The book is crammed with interesting stories of Dr. Finney's experiences in war and peacetime surgery and of his encounters with men and women in all walks of life, from hospital orderlies to U. S. Presidents.

Science News Letter, February 1, 1941

BOTANY—JUVENILE

AMERICAN WILD FLOWERS—Cecile Hulse Matschat—*Random*, 28 p., col. pl., 50c. Big pictures, in colors, of 19 common Eastern wildflowers with simple descriptions in large type for children who have just become able to read fluently.

Science News Letter, February 1, 1941

ORNITHOLOGY

AMERICAN SONGBIRDS—Maitland A. Edey—*Random House*, 70 p., \$1. A score and a half of Fuertes bird illustrations in color, with brief popular descriptions, and all for a dollar. Just the thing for the beginner in bird study, who needs pictures to aid in identifications but can't afford to spend much money.

Science News Letter, February 1, 1941

GEOGRAPHY

GEOGRAPHY IN HUMAN DESTINY—Roderick Peattie—*Stewart*, 323 p., illus., \$3. A geographer "talks" in easy, informal fashion about the geography of war and peace, and various ways in which the earth itself spurs on human struggles and desires. Hopeful for an economic solution of world problems, he says: "What is fundamentally wrong with the world, except for the persistent inhumanity of humans, is distribution and man's inability to redistribute."

Science News Letter, February 1, 1941

ANTHROPOLOGY

CALIFORNIAN BONE ARTIFACTS—E. W. Gifford—*Univ. of Calif. Press*, 84 p., illus., \$1.25.

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MEDICINE—HISTORY

A HISTORY OF MEDICINE—Arturo Castiglioni; trans. by E. B. Krumbhaar—*Knopf*, 1058 p., illus., \$8.50. This is the first general history of medicine in English which has appeared during the past decade. It has thus the double value

of being up-to-date and of giving to English-speaking readers a new view of the part taken by Italy in the history of medicine.

Science News Letter, February 1, 1941

MALACOLOGY

WORLD-WIDE SEA SHELLS—Maxwell Smith and Joshua L. Baily—*Pub. by Author, Tropical Photographic Laboratory, Lantana, Fla.*, 139 p. illus., \$4.50. An illustrated list of shells most likely to be found in amateurs' collections. The pictures are mostly line drawings and the book is produced by offset process. In addition, there is an interesting short essay by Dr. Baily, on the origin of scientific names.

Science News Letter, February 1, 1941

BOTANY

STUDIES OF AMERICAN PLANTS, XI—Paul C. Standley—*Field Museum of Natural History*, 85 p., 50 c.

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MEDICINE

SEX IN DEVELOPMENT—Carney Landis and others—*Hoeber*, 329 p., \$3.75. From a study of the "growth and development of the emotional and sexual aspect of personality together with physiological, anatomical and medical information on a group of 153 normal women and 142 female psychiatric patients," Dr. Landis and co-workers have drawn a number of conclusions that will be of interest to psychiatrists, other medical scientists, and educators. The authors believe their studies show the way "to a new approach to the problems of feeling and emotion as they are related to personality development and formation."

Science News Letter, February 1, 1941

MEDICINE

CLINICAL PELLAGRA—Seale Harris and Seale Harris Jr.—*Mosby*, 494 p., illus., \$7. Physicians and public health workers will be interested in this book in which a number of authorities besides the authors have collaborated to give as complete as possible a picture of past and present knowledge of and views on pellagra.

Science News Letter, February 1, 1941

HOME ECONOMICS

INTRODUCTORY FOODS—Osee Hughes—*Macmillan*, 522 p., illus., \$3. Designed as a text introductory to further study in dietetics and nutrition.

Science News Letter, February 1, 1941

SOCIOLOGY

BORROWED CHILDREN: A Popular Account of Some Evacuation Problems and Their Remedies—Mrs. St. Loe Strachey—*Commonwealth Fund*, 149 p., 75 c. Little children leaving home and going among strangers who do not understand, at least at first, all the individualities of their make-up and the problems of adjustment—this situation, all too familiar in our present-day world, gives rise to this volume originally published in England but with poignant interest for American readers.

Science News Letter, February 1, 1941

HORTICULTURE

GREEN ENCHANTMENT, The Magic Spell of Gardens—Rosetta E. Clarkson—*Macmillan*, 329 p., illus., \$3. The story of medieval and early modern gardens and gardening, charmingly told and as charmingly illustrated. Decidedly, a book for garden lovers who want to know more about the origins and background of their gentle art.

Science News Letter, February 1, 1941

BOTANY

BOTANY OF THE MAYA AREA—Cyrus Longworth Lundell and others—*Carnegie Institution of Washington*, 474 p., illus., cloth, \$2.75; paper, \$2.25. (Miscellaneous Papers XIV-XXI). The story of the rise and decay of Maya states in the Middle Americas is written in the trees and lesser plants that have taken possession of the silent temples and deserted marketplaces no less than in the stones of the ruins themselves. These technical descriptions, written by a thoroughly competent taxonomist, will benefit later-coming botanists, particularly the ecologists whose labors supplement those of archaeologists in spelling out the history of what happened as men departed and the jungle took over.

Science News Letter, February 1, 1941

BOTANY—ENTOMOLOGY

PLANT GALLS AND GALL MAKERS—Ephraim Porter Felt—*Comstock*, 364 p., illus., \$4. A relatively neglected field, though of interest to both botanists and entomologists, is that of plant galls. Here, a well-known entomologist undertakes to fill in the gap, with a dichotomous key arranged by classification of host plants. Illustrations are both photographic and black-and-white, and both kinds give good support to the descriptions.

Science News Letter, February 1, 1941